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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/881,873
Filing Date: June 14, 2001
Appellant(s): BHOGAL ET AL.

MAILED

AUG 23 2007

Technology Center 2600

Bhokal et al.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/26/07 appealing from the Office action
mailed 1/16/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

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| | | |
|-----------|-------------------|---------|
| 5,966,509 | Abe et al. | 01-1999 |
| 4,200,711 | Kraushaar et al. | 04-1980 |
| 6,112,077 | Spitaletta et al. | 08-2000 |
| 5,987,107 | Brown | 11-1999 |

Toda, Kensuke "Telephone set with call count display-incorporates controller to initiate count, counter clock and adder to record total number of calls during discounted tariff time period", JP 07066909 A (March 10, 1995).

Schwedes et al., "Metering call charge rate display for telecommunication terminal--", DE 19646892 A, (March 4, 2004).

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Objections

Claims 2 and 17 are objected to because of the following informalities: claims 2 and 17 recite, "summing the modified call count". Received is "a call" and modified is "the call", as shown in claim 1. Since there is no more than one call indicated, appellant needs to clearly/show how and into what a call (one call) can be modified. Appropriate correction is required.

Claims 3 and 18 are objected to because of the following informalities: the claims recite 'subtracting the modified call count from a time ration'. Although such a description exists in the disclosure, examiner finds it difficult to understand since the

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feature contradicts the convention of measuring units, which are conventions/norms in arithmetic. According to the recited feature, a call count (call per time) is being subtracted from time ration, which is a fraction of time. Appropriate correction is required.

Claims 4 and 19 are objected to because of the following informalities: the claims recite 'rounding the call count'. The specification clearly provides rounding time; but, it does not say/show how a call count is rounded. Besides, a call count deems to be a whole number that does not require rounding. Furthermore, claim 1 does not provide counting more than one call and examiner does not see how and into what one call could be rounded off. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 6, 16, 17, 21 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Lahtinen (US 6,275,708 B1).

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As per claim 1: Lahtinen discloses a method of tracking communications usage time (see abstract) comprising:

Counting time increments in response to a call (see fig. 2, elements 86 and fig. 3, elements 23 and 24; col. 3, lines 64-66);

determining a call count based on time increments (see fig. 2, element 85 and fig. 3, steps 21, 23-24; col. 3, lines 63-64); and

modifying the call count based on calling plan parameters (see abstract; col. 4, lines 3-26; claims 1 and 7). As can be clearly seen, particularly in fig. 3, calls are counted based on time (hence both calls and time are counted) and calls are added, hence modified. As also can be clearly seen, particularly in the abstract, a paging load of a communication system is limited based on the number of calls initiated in a given time interval. Examiner surmises that limiting a call is a calling plan, and number of calls and time intervals are the call limiting/calling plan/ parameters.

As per claim 2: Lahtinen discloses a method of adding the modified call count (see col. 4, lines 17-26; claim 7);

determining an accumulated call count (see fig. 3, element 23; col. 4, lines 17-29; claim 7);

determining an accumulated call count (see fig. 3, elements 29 and 21; col. 4, lines 17-29; claim 7). According to the prior art, calls are increased or decreased until reaching a preset threshold value, hence the increase or decrease provides an accumulated call value (see also, col. 4, lines 47-59).

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As per claim 6: Lahtinen discloses a method, wherein modifying the call count comprises discounting/deducting an incoming call (see col. 4, lines 47-59; claim 7). As disclosed, the prior art counts calls upward or downward, hence increasing or decreasing a call count.

As per claim 16: the features of claim 16 are similar to the features of claim 1, except claim 16 is directed to a computer readable medium intended to perform the steps of claim 1. However, the prior art discloses the steps of claim 1, as discussed therein. Hence, the computer readable medium must be an inherent feature in the prior art communication system.

As per claim 17: the features of claim 17 are similar to the features of claim 2. Hence, claim 17 is rejected on the same ground as claim 2 and including the explanation provided regarding the rejection of claim 16.

As per claim 21: the feature of claim 21 is similar to the feature of claim 6. Hence, claim 21 is rejected on the same ground as claim 6, including the explanation provided regarding the rejection of claim 16.

As per claim 31: the features of claim 31 are similar to the features of claim 1, except claim 31 is directed to a system comprising means to perform the functions/steps of claim 1. However, the prior art discloses the steps of claim 1, as discussed therein. Hence, a system/means that performs the steps of claim 1 must be an inherent feature within the embodiment of the prior art.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-8, 22-23 and 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lahtinen in view of Toda (assigned to NEC CORP), (JP 07066909

A). For examination purpose, claim 32 is considered first.

As per claim 32: Lahtinen discloses a method of tracking communications usage time (see abstract) comprising:

(see fig. 2, elements 86 and fig. 3, elements 23 and 24; col. 3, lines 64-66);

determining a call count based on time increments (see fig. 2, element 85 and fig. 3, steps 21, 23-24; col. 3, lines 63-64); and

modifying the call count based on calling plan parameters (see abstract; col. 4, lines 3-26; claims 1 and 7). As can be clearly seen, particularly in fig. 3, calls are counted based on time (hence both calls and time are counted) and calls are added, hence modified. As also can be clearly seen, particularly in the abstract, a paging load of a communication system is limited based on the number of calls initiated in a given time interval. Examiner interpreted that limiting a call is a calling plan, and number of calls and time intervals are the call limiting/calling plan/ parameters.

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But, Lahtinen does not explicitly teach about storing the modified call count in the memory of a cellular telephone unit, as claimed by applicant. However, in the same field of endeavor, Toda teaches about a telephone set comprising a counter for recording the calls performed and an adder for accumulating/storing the calls counted during a discounted tariff time period based on the output of a clock (see abstract). It is to be noted that the accumulated call count can be considered as a modified call count since the accumulated call count is not the same as the initial call count. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the teaching of Lahtinen with that of Toda for the advantage of a subscriber to optimize utilization of discount tariff during a specified time period.

As per claim 7: Toda teaches a method, wherein modifying the call count comprises discounting a night time call (see title; abstract). Toda's reference teaches about a discounted tariff time period, which could include any discounted time period designated for such purpose, including night time call discount.

As per claim 8: Toda teaches a method, wherein modifying the call count comprises discounting a weekend call (see title; abstract). Toda's reference teaches about a discounted tariff time period, which could include any discounted time period designated for such purpose, including a weekend call discount time period.

As per claim 22: the feature of claim 22 is similar to the feature of claim 7. Hence, claim 22 is rejected on the same ground and motivation as claim 7 and further including the explanation provided regarding the rejection of claim 16.

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As per claim 23: the feature of claim 22 is similar to the feature of claim 8. Hence, claim 23 is rejected on the same ground and motivation as claim 8 and further including the explanation provided regarding the rejection of claim 16.

Claims 3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lahtinen, as applied to claims 1 and 16 above, and further in view of Schwedes et al. (DE 19646892 A1).

As per claim 3: but, Lahtinen, as applied to claims 1 and 16 above, does not explicitly teach about determining a remaining call time, as claimed by applicant. However, in the same field of endeavor, Schwedes teaches about metering call charge rate display for telecommunication terminal, wherein the remaining time to the next call charge rate is displayed, using a counter that continuously counts the remaining or expired time with respect to a received call charge rate (see abstract). Note: although the claim calls **"subtracting the modified call count from a time ration'** to determine the remaining call time, the prior art arrives at same result (determining remaining call time) using a different technique. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the teaching of Lahtinen with that of Schwedes for the advantage of enabling a subscriber to determine the remaining time to the next call.

As per claim 18: the features of claim 18 are similar to the features of claim 3. Hence, claim 18 is rejected on the same ground and motivation as claim 3, and further including the explanation provided in relation with the rejection of claim 16.

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Claims 4 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lahtinen, as applied to claims 1 and 16 above, and further in view of Abe et al. (Abe) (US 5, 966,509).

As per claim 4: But, Lahtinen, as applied to claims 1 and 16 above, does not explicitly teach about rounding a call count, as claimed by applicant. However, in the same field of endeavor, Abe teaches about a network management device including rounding of a call count (see col. 26, lines 19-38). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teaching of Lahtinen with that of Abe for the advantage of providing a better call count management.

As per claim 19: the feature of claim 19 is similar to the feature of claim 4. Hence, claim 19 is rejected on the same ground and motivation as claim 4.

Claims 5 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lahtinen, as applied to claims 1 and 16 above, and further in view of Kraushaar et al. (Kraushaar) (US 4, 200,771).

As per claim 5: but, Lahtinen, as applied to claims 1 and 16 above, does not explicitly teach about a method of subtracting an initial connection time from a call count, as claimed by applicant. However, in the same field of endeavor, Kraushaar teaches about "traffic measuring device based on state transaction" wherein a call time monitor/time counter is provided to monitor current time which is either to be added to or subtracted from an accumulated total call duration (see col. 5, 3-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teaching of Lahtinen with that of Kraushaar for the advantage of providing more accuracy in counting calls (see abstract, lines 1-7).

As per claim 20: the feature of claim 20 is similar to the feature of claim 5. Hence, claim 20 is rejected on the same ground and motivation as claim 5.

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Claims 9-13 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lahtinen, as applied to claims 1 and 16 above, and further in view of Spitaletta et al. (Spitaletta) (US 6,112,077).

As per claim 9: while Lahtinen discloses/teaches a modified call count, as discussed in the rejection of claims 1 and 16, a modified call count is provided by Lahtinen. But Lahtinen alone or in view of Toda, does not explicitly teach about a method further comprising – providing a special usage parameter (rate) and calculating a special call count based on the special usage parameter (rate), as claimed by applicant. However, in the same field of endeavor, Spitaletta teaches about a non-reusable cellular telephone, wherein the cellular telephone is provided with a means to account for the cost difference of calls made to different calling areas, including calls within one area code (local) and long distance calls by deducting time at different rate (see col. 4, lines 19-34). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the teaching of Lahtinen with that of Spitaletta for the advantage of enabling the cellular telephone to store a plurality of rate factors corresponding to area codes and dialing prefixes of possible phone numbers for calculating the remaining time of the calling time (see col. 2, lines 27-30).

As per claim 10: Spitaletta teaches about a method, wherein the special usage parameter comprises a long distance parameter (rate), and the special call count comprises a long distance usage count (see col. 4, lines 19-34).

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As per claim 11: Spitaletta teaches about a method, wherein the special usage (rate) comprises a local distance parameter (rate), and the special call count comprises a local distance usage count (see col. 4, lines 19-34).

As per claim 12: the feature of claim 12 is similar to the feature of claim 7, with the exception that the call in claim 12 recites '**special usage parameter**', which reads on Toda's "calls counted during a discount tariff time" (see Toda's abstract). Hence, claim 12 is rejected on the same ground and motivation as claim 7.

As per claim 13: the feature of claim 13 is similar to the feature of claim 8, with the exception of claim 13 recites '**special usage parameter**'. Toda's "calls counted during a discount tariff time" could be read as a call comprising a special usage parameter, wherein discount tariff time is the parameter. Hence, claim 13 is rejected on the same ground and motivation as claim 8.

As per claim 24: the features of claim 24 are similar to the features of claim 9. Hence, claim 24 is rejected on the same ground and motivation as claim 9 and further including the explanation provided with regard to the rejection of claim 16.

As per claim 25: the feature of claim 25 is similar to the feature of claim 10. Hence, claim 25 is rejected on the same ground and motivation as claim 10 and further including the explanation provided with regard to the rejection of claim 16.

As per claim 26: the feature of claim 26 is similar to the feature of claim 11. Hence, claim 26 is rejected on the same ground and motivation as claim 11 and further including the explanation provided with regard to the rejection of claim 16.

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As per claim 27: the feature of claim 27 is similar to the feature of claim 7, with the exception that the call in claim 27 recites '**special usage parameter**'. In Toda, "calls counted during a discount tariff time" is similar to a special usage parameter, wherein time is the parameter. Hence, claim 27 is rejected on the same ground and motivation as claim 7.

As per claim 28: the feature of claim 28 is similar to the feature of claim 8, with the exception, that claim 28 recites '**special usage parameter**'. In Toda, "calls counted during a discount tariff time" is similar to a special usage parameter, wherein time is the parameter. Hence, claim 28 is rejected on the same ground and motivation as claim 8.

Claims 14-15 and 29 -30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lahtinen in view of Spitaletta, as applied to claims 1, 9, 16 and 24 above, and further in view of Brown (US 5,987,107).

As per claim 14: but, Lahtinen in view of Spitaletta does not explicitly teach about a method, wherein the special usage parameter comprises a peak usage parameter, and the special call count comprises a peak usage count, as claimed by applicant. However, in the same field of endeavor, Brown teaches about charging for usage of a telecommunications network, wherein calls are defined by type, each call being identified based on the call type and calculating and accumulating charges (see col. 2, lines 10-37; col. 5, lines 41-56), utilizing discount schemes. Note: call type, in the context of Brown's reference is considered to include peak type call. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to further modify Lahtinen in view of Spitaletta with the teaching of Brown for the

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advantage of encouraging increased use of a network during off-peak periods (see col. 2, lines 10-22).

As per claim 15: Brown teaches a method, wherein the special usage parameter comprises an off-peak usage parameter, and the special call count comprises an off-peak usage count (see col. 2, lines 10-37; col. 5, lines 41-56). Brown also provides motivation as a marketing tool for " ---providing discounts for particular types of calls" (see col. 2, lines 10-11).

As per claim 29: the feature of claim 29 is similar to the feature of claim 14. Hence, claim 29 is rejected on the same ground and motivation as claim 14.

As per claim 30: the feature of claim 30 is similar to the feature of claim 15. Hence, claim 30 is rejected on the same ground and motivation as claim 15.

(10) Response to Argument

Appellant's arguments filed 6/26/07 have been fully considered but they are not persuasive. Arguments and responses are shown in the following text.

Argument I: with regard to claims 2-4 and 17-19, appellant asserts that the objection, due to informalities, to these claims should be withdrawn since they have escaped examiner's attention in previous Office Actions.

Response I: examiner respectfully disagrees with the argument. Although the best time for making objections based on claim informalities is at the earlier stages of prosecution, objections can be made at any time. Furthermore, claim objections to claim

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informalities are subject to petition and rejections to appeal. Hence, according to MPEP, 37 CFR 41.39, examiner is not required to answer to arguments based on objections to claim informalities. In other words, objections to claim informalities are not appealable.

Argument II: with regard to claims 1, 16 and 31, appellant argues by saying, "no mention of calling plan parameters is included in the disclosures of Lahtinen".

Response II: examiner respectfully disagrees with the argument. In that, as discussed in the body of the rejection of claims 1, 16 and 31, Lahtinen discloses number of calls and time interval within which calls are counted. Examiner considers these variables as calling parameters and limiting the page/call load to a predetermined maximum is the calling plan/goal.

Argument III: with regard to claims 6 and 21, appellant argues by saying, "Lahtinen does not disclose discounting an incoming call, as claimed in claims 6 and 21".

Response III: examiner respectfully disagrees with the argument. In that, Lahtinen discloses that a call counter that can count calls upward and downward, wherein examiner considers counting calls downward as discounting a call count (see col. 4, lines 47-59).

Argument IV: with regard to claims 32, appellant argues by saying, "Lahtinen fails to teach or suggest modifying the call count based on calling plan parameters, as claimed", and "neither Lahtinen nor Toda discloses or teaches storing the modified call count in the memory of a cellular telephone unit, as claimed in claim 32."

Response IV: examiner respectfully disagrees with these arguments. First, Toda's telephone set includes a call counter (wherein call count is obviously modified as calls

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are counted); and second, an adder that accumulates/store the counted/modified calls (see abstract). Hence, Toda clearly teaches that calls, not only counted/modified, but also accumulated/stored in a handset.

Argument V: with regard to claims 7 and 22, appellant asserts that since Lahtinen and Toda do not disclose or teach discounting a call for any reason, the references alone or in combination cannot teach or suggest discounting a nighttime call as claimed in claims 7 and 22 or discounting a weekend call as claimed in claims 8 and 23.

Response V: examiner respectfully disagrees with the argument. As discussed above, particularly in the rejections of claims 7 and 8, Toda teaches accumulating calls counted "during a discounted tariff time period". Examiner maintains that one of ordinary skill in the art knows would consider that "nighttime" and "weekend" are tariff time periods. As such, the modified Lahtinen system would have Toda's handset incorporated therein for storing modified call count/s including calls made in discount tariff time periods.

Argument VI: with regard to claim 32, appellant further argues by saying "there can be no motivation to combine Lahtinen with Toda to store data in the memory of a cellular telephone unit, as claimed in claim 32."

Response VI: examiner respectfully disagrees with the argument. In that Toda states that the features incorporated into the handset (counter, adder) are advantageous for "optimum utilization of discount tariff during specified time periods". Examiner maintains that this would prompt/motivate one of ordinary skill in the art to modify Lahtinen's mobile station (see fig. 1, MS) for the advantage of optimizing discount tariff during a specified time periods.

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Argument VII: with regard to claim 32, appellant further argues by saying that "combining the alleged teachings of Toda with Lahtinen would destroy the principle of operation of Lahtinen, in contravention of the strictures of §103 (a)", by citing that Lahtinen's system is network centric and Toda's is handset-wise.

Response VII: examiner respectfully disagrees with the argument. In that, what is modified in Lahtinen's system is the MS (mobile station), not the network. Stated differently, it would be permissible for one of ordinary skill in the art to modify Latinen's MS (mobile station) with the features provided in Toda's handset. Since, a handset and a MS are within same field of endeavor, they are combinable without destroying each other, as asserted by appellant.

Argument VIII: with regard to claims 14-15 and 29-30, examiner, in rejecting claims 14-15 and 29-30, stated in the heading, "unpatentable over the above and further in view of Brown (US 5,987,107)", missing the word, **references**. Appellant asserts, "no such patent or reference is previously listed in the rejection, and no such citation exists elsewhere in the file" and hence "unable to determine a citation for a reference termed "the above."

Response VIII: examiner sincerely regrets the confusion this minor typographical error may have caused applicant. The heading of the rejection of claims 14-15 and 29-30 has now been corrected by listing the applicable references therein.

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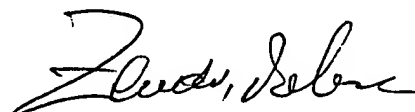
(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Meless Zewdu (Primary examiner of the record)



10 August 2007

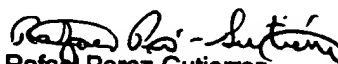
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Art Unit 2617

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TIME CYCLE-RELATED BILLING UNIT-USAGE DISPLAY
[Zeittakt-bezogene Tarifeinheiten-Verbrauchsanzeige]

Meike Schwedes et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. APRIL 2008
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| INVENTORS | (72): | Meike Schwedes et al. |
| APPLICANT | (71): | Deutsche Telekom AG |
| TITLE | (54): | TIME CYCLE-RELATED BILLING UNIT-USAGE DISPLAY |
| FOREIGN TITLE | [54A]: | Zeittakt-bezogene Tarifeinheiten-Verbrauchsanzeige |

The invention relates to a time cycle-related billing unit-usage display device for a telecommunications end device, in particular, a telephone, according to the preamble of Claim 1.

Billing-unit counters are known, which are either integrated into a telephone or connected before the telephone. The known billing-unit counters display to a customer the costs incurred during a telephone call and also, after disconnecting the call, the total costs of the call. Especially in view of the background that the connection costs are dependent on the time of day, the day of the week, and also the distance between the calling and the receiving parties, the party responsible for the costs is interested not only in the running costs of a call or the total costs at the end of the call, but he would also like to know how long, for example, the current time cycle is, in order to be able to better optimize the call costs.

Therefore, the invention is based on the task of creating a time cycle-related billing unit-usage display device, which provides the party responsible for the costs more transparency in the usage of billing units during an existing telecommunications connection.

The invention solves the technical problem with the features of Claim 1.

So that the party responsible for the costs can gain a better overview of the costs to be expected for the call, it is necessary that the duration of the current time cycle can be displayed during a communications connection. For this purpose, the time cycle-related billing unit-usage display device has a detector device for determining the duration of the current time cycle, wherein the duration can be displayed continuously on a display allocated to the usage display device.

Advantageous refinements are specified in the subordinate claims.

To further improve the billing-unit transparency during a connection, not only the duration of the current time cycle, but also the progressive usage of a defined billing unit can be monitored by the customer himself. For this purpose, the time cycle-related billing unit-usage display device has a counter, which progressively counts, as a response to each received billing unit request signal, the

elapsed time or the related remaining time until the receipt of the next billing unit request signal and transmits this time to the display. In the description as a whole and also in the claims, the term "billing unit request signal" is understood to be, in an analog case, the conventional count pulse (16-kHz pulse) and, in the case of a digital application, control information transmitted, for example, via the D-channel of the ISDN base connection for specifying a new time cycle.

Instead of displaying the elapsed time or the remaining time between two successive billing unit request signals, it is possible to calculate and display the associated consumed or remaining monetary value. The current billing unit equals 0.12 DM per time cycle.

For determining the duration of the current time cycle, the time cycle-related billing unit-usage display device can include a timing device, which measures the time difference at least between the first and second billing unit request signals after the beginning of the connection. Such a billing unit-usage display device is relatively simple to realize. However, for the first time the duration of the second time cycle after the beginning of a communications connection can be displayed.

To be able to display the duration of the current time cycle after already receiving the first billing unit request signal in the form of a monetary value or units of time, there is a memory device for storing time of day-dependent, day of week-dependent, and/or distance-dependent billing units, wherein the detector device is designed for determining the duration of the current time cycle from the currently valid billing unit.

According to a third embodiment, which is meaningful only for an analog subscriber line, the detector device is designed for the demodulation of count pulses each modulated with information on the duration of the time cycle. This means that the count pulse from an exchange to a subscriber line device has been modulated with the corresponding information.

The invention will be explained in more detail below with reference to an embodiment in connection with the accompanying drawing.

Figure 1 shows a telecommunications end device, which is designated in general with 10 and which is, in our example, an analog telephone. The telephone 10 is connected to an exchange via an analog subscriber line device 30 and a subscriber line (not shown). In the telephone there can be a time cycle-related billing unit-usage display device 15, which can include a display 20, a detector device 40, which is still to be described in more detail and which is connected to the display, and also optionally a memory device 50, a counter 60, and a device 70 for converting units of time into corresponding monetary values. The billing unit-usage device 15, however, can also be connected externally to the telephone 10. In this case, it is conceivable that the billing unit-usage display device 15 has its own display and the detector device 40 is therefore connected to a display arranged in the telephone. The analog telephone 10 is designed, for example, for receiving 16-kHz count pulses, which are transmitted during a call connection to the subscriber line device 30. In the memory 50, device-specific internal software can be stored, which contains, among other things, several billing units, which set the corresponding duration of a time cycle as a function of the day of the week, the time of day, and the distance between a calling and a receiving party.

The function of the time cycle-related billing unit-usage display device 15 is explained in more detail below in connection with the telephone 10. Now it shall be assumed that the user of the telephone 10 wants to initiate a call connection to a remote user. For example, at the same time as the beginning of the call, the exchange transmits a first count pulse to the analog subscriber line device 30. As a function of the selected call number, the current time of day, and the day of the week, the detector device 40 reads the associated billing unit from the memory device 50. With the help of the read billing unit, the detector device 40 can determine the duration of the current time cycle. In other words, the detector device 15 is

in the position, immediately after receipt of the first count pulse, to calculate the time span up to the receipt of the second count pulse. The duration of this time cycle is then displayed to the user on the display 20. The duration of the determined time cycle is similarly transmitted to the counter 60, which progressively measures, as a response to the first received count pulse, the elapsed time or the related remaining time until the receipt of the second count pulse and transmits this time to the display 20. If the duration of the time cycle determined by the detector device 40 equals, for example, 30 seconds, the counter 60 counts either from 0 to 30 or from 30 to 0. Here, the units of time to display (seconds, milliseconds) is set according to accuracy requirements. Instead of displaying the elapsed time or remaining time between the two count pulses (the time distance between two successive count pulses is also designated as the time cycle or billing unit) to the customer, the associated consumed or remaining monetary value can also be displayed to the customer with respect to the current billing unit. For this purpose, the converting device 70 converts the elapsed time or remaining time into a corresponding consumed or remaining monetary value. In this way, the user responsible for the costs is in the position to monitor not only the duration of the current time cycle, but also the currently remaining value of the billing unit paid in advance. After receipt of the second count pulse, the detector device 40 recalculates on the basis of the current billing unit the duration of the current time cycle and transmits this both to the display 20 and also to the counter 60. The counter 60 is triggered by the received second count pulse and then progressively measures, in turn, the elapsed time or the related remaining time until the receipt of the third count pulse. If the current billing unit changes during the call, then the detector device 40 reads the new billing unit in due time before the change from the memory device 50. In this way, it is guaranteed that the correct, i.e., currently valid duration of the current time cycle or the correct elapsed time or remaining time between two successive count pulses is always displayed to the user responsible for the costs. The timely reading of the valid billing unit can also be realized by means of a

programmable control unit, which can be connected to a clock and to an electronic calendar. It is also conceivable that the detector device 40 itself is connected to an electronic calendar and to a clock.

According to a simplified embodiment, the billing unit-usage display device includes the display 20, the counter 60, the converting device, and the detector device 40. The detector device 40 this time involves a timing device, which measures the time difference between the first and second count pulse, calculated from the beginning of the connection. This has the disadvantage, however, that the user responsible for the costs is first informed on the duration of the current time cycle at the beginning of the second time cycle. The counter 60 receives from the detector device 40 the determined time cycle duration and counts, as already mentioned above, as a response to each received time pulse, the elapsed time or remaining time between two count pulses.

In another embodiment, which is meaningfully suitable only for analog telecommunications devices, in the exchange a modulator is implemented which modulates information containing the duration of each time cycle on each 16 kHz pulse. In this case, the detector device 40 is formed as a modulator, which can demodulate the modulated time pulses, in order to retrieve the corresponding duration of the time cycle. In this embodiment, it is guaranteed that the correct time cycle can also be determined for a change in time zone during a connection.

Claims

1. Time cycle-related billing unit-usage display device for a telecommunications end device (10), characterized by a detector device (40) for determining the duration of the current time cycle, which can be displayed continuously on a display (20) allocated to the usage display device (15).
2. Time cycle-related billing unit-usage display device according to Claim 1, characterized by a counter (60), which progressively counts, as a response to each received billing unit request signal, the

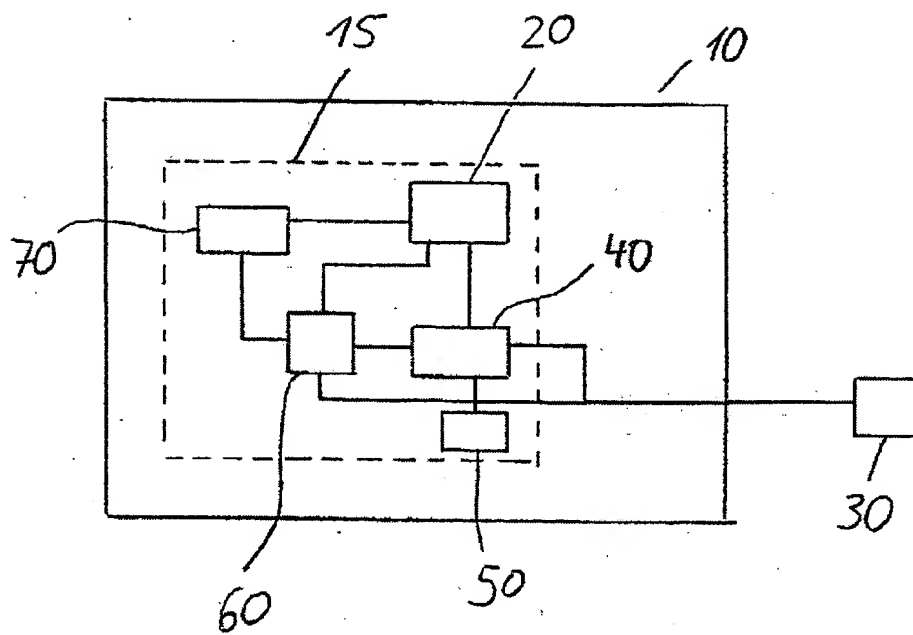
elapsed time or the related remaining time until receipt of the next billing unit request signal and transmits this time to the display (20).

3. Time cycle-related billing unit-usage display device according to Claim 2, characterized by a device (70) for the continuous conversion of the elapsed time or remaining time into a proportional consumed or remaining billing-unit value.

4. Time cycle-related billing unit-usage display device according to one of Claims 1-3, characterized in that the detector device (40) includes a timing device, which measures the time difference at least between the first and second billing unit request signals after the beginning of the connection.

5. Time cycle-related billing unit-usage display device according to one of Claims 1-3, characterized by a memory device (50) for storing time of day-dependent, day of week-dependent, and/or distance-dependent billing units, wherein the detector device is designed for determining the duration of the current time cycle from the current billing unit.

6. Time cycle-related billing unit-usage display device according to one of Claims 1-3, characterized in that the detector device (40) is designed for the demodulation of billing unit pulses modulated with information on the duration of the time cycle.



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TELEPHONE SET WITH COMMUNICATION FREQUENCY DISPLAY FUNCTION
[Tsuwa dosu hyoj kino tsuki denwaki]

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Claims

1. A telephone set with a communication frequency display function, characterized by the fact that in a telephone set with a communication frequency display function equipped with a telephone set control part for controlling the telephone set and transmitting and receiving a control signal with an exchange and a measurer that is connected to the telephone set control part and measures a communication frequency and a communication fee, it is equipped with a clock means for outputting a time information and a frequency adder for adding the output of the above-mentioned measurer at a month unit in a time zone with a discount of the communication fee based on the time information of the clock means; and the above-mentioned display part includes a means for displaying the output of the frequency adder.

2. The telephone set with a communication frequency display function of Claim 1, characterized by the fact that the above-mentioned frequency adder includes a reset switch for resetting the communication frequency at a time of initialization and a means for automatically, monthly setting the communication frequency.

3. The telephone set with a communication frequency display function of Claim 1, characterized by the fact that the above-mentioned display part includes a means for displaying a reference communication frequency and an object limit of a monthly maximum discount service by an operation.

Detailed explanation of the invention

[0001]

Industrial application field

The present invention pertains to a telephone set with a communication frequency display function. In particular, the present invention pertains to a telephone set with a communication function display function for a monthly maximum discount service (communication fee discount service "telejouz" of

NTT) in a time zone with a discount of a communication fee. Especially, the present invention pertains to a telephone set with a communication frequency display function for displaying a communication frequency in a time zone with a discount of a communication fee at a month unit.

[0002]

Prior art

Conventional telephone sets with a communication frequency display function have a constitution in which the frequency at a communication unit is measured as a communication frequency measurement function (Japanese Kokai Patent Application Nos. Sho 57[1982]-25763, Sho 61[1986]-35057, and Sho 64[1989]-46369).

[0003]

Problems to be solved by the invention

However, in these conventional telephone sets with a communication frequency display function, since the frequency at a communication unit was measured and the communication frequency at a month unit in a time zone with a discount of a communication fee was not measured and displayed, when there was a monthly maximum discount service in the time zone with a discount of the communication fee, this service could not be effectively utilized.

[0004]

The present invention solves the above-mentioned problems, and its purpose is to provide a telephone set with a communication frequency display function that can effectively utilize a monthly maximum discount service in a time zone with a discount of a communication fee.

[0005]

Means to solve the problems

The present invention is characterized by the fact that in a telephone set with a communication frequency display function equipped with a telephone set control part for controlling the telephone set and transmitting and receiving a control signal with an exchange and a measurer that is connected to the telephone set control part and measures a communication frequency and a communication fee, it is equipped with a clock means for outputting a time information and a frequency adder for adding the output of the above-mentioned measurer at a month unit in a time zone with a discount of the communication fee based on the time information of the clock means; and the above-mentioned display part includes a means for displaying the output of the frequency adder.

[0006]

Also, in the present invention, the above-mentioned frequency adder includes a reset switch for resetting the communication frequency at the time of initialization and a means for automatically, monthly setting the communication frequency.

[0007]

Furthermore, in the present invention, the above-mentioned display part includes a means for displaying a reference communication frequency and an object limit of a monthly maximum discount service by an operation.

[0008]

Operation

Since a communication frequency is calculated in a time zone with a discount of a communication fee, the communication frequency calculated is automatically reset monthly and the value added until the month is changed after starting from "0" is displayed, the communication frequency used is understood, and the monthly maximum discount service in a time zone with a discount of a communication fee can be effectively utilized. Also, since the reference communication frequency and the object limit of the monthly maximum discount service are displayed, the usage state is effectively confirmed.

[0009]

Application example

An application example of the present invention is explained referring to the figures.

[0010]

Figure 1 is a constitutional block diagram showing the telephone set with a communication frequency display function of an application example of the present invention. In Figure 1, the telephone set with a communication frequency display function is equipped with a telephone set control part 1 for controlling the telephone set and transmitting and receiving a control signal with an exchange, a measurer 2 that is connected to the telephone control part 1 and measures a communication frequency and a communication fee, a display part 4 for displaying the measurement content, a central control device 6, a memory 7, a measurer 2, and an address data bus 10 for connecting the central control device 6 and the memory 7.

[0011]

Here, the present invention is characterized by the fact that a clock means 5 for outputting a clock information and a frequency adder 3 for adding the output of the measurer 2 in a time zone with a discount of a communication fee based on the time information of the clock means 5 at a month unit are provided; and a display part 4 includes a means for displaying the output of the frequency adder 3.

[0012]

Also, the frequency adder 3 includes a reset switch 31 for resetting the communication frequency at a time of initialization and a means for automatically, monthly setting the communication frequency.

[0013]

Furthermore, in the present invention, the display part 4 includes a set switch 41 as a means for displaying a reference communication frequency and an object limit of a monthly maximum discount service by an operation.

[0014]

The operation of the telephone set with a communication frequency display function with this constitution is explained.

[0015]

Figure 2 shows the display content of the display part of the telephone set with a communication frequency display function of the present invention. Figure 3 is a flow chart showing the operation of the

frequency adder of the telephone set with a communication frequency display function of the present invention. In Figure 2, the display part 4 displays the added communication frequency (here, 100) and displays a reference communication frequency (here, 200) and an object limit (here, 300) of a monthly maximum discount service by set switch 41. Thus, the usage state can be confirmed, so that the monthly maximum discount service can be effectively utilized.

[0016]

In Figure 3, the operation of the frequency adder 3 is explained. First, in the frequency adder 3, the communication frequency is reset by the reset switch 31 (S1). When the monthly maximum discount service is active (S2), a communication is started (S3), and in a time zone with a discount of a communication fee (S4), the addition of the communication frequency is started (S5). The communication frequency added is displayed on the display part 4. In the state of the time zone with a discount of a communication fee (S4), when no month is changed (S11) during the addition of the communication frequency (S5) and the communication is finished (S6), the addition of the communication frequency is finished, and the flow returns to step 2 (S7). Also, in the state of the time zone with a discount of a communication fee (S4), when the month is changed (S11) during the addition of the communication frequency (S5), the communication frequency is reset (S12), and the addition of the communication frequency is started (S5). When the communication is finished (S6), the addition of the communication frequency is finished, and the flow returns to step 2 (S7).

[0017]

At step S4, when there is no time zone with a discount of a communication fee in spite of the communication start and no month is changed (S11), the communication frequency is not added, and if

the communication is finished, the flow returns to step S2 (S10). Also, when there is no time zone with a discount of a communication fee in spite of the communication start and the month is changed (S11), the communication frequency is reset (S12), and the communication frequency is not added. If the communication is finished, the flow returns to step S2 (S10). Furthermore, at step S4, when the time zone has a discount of a communication fee at the beginning and does have a discount of a communication fee during the communication, the communication frequency is not added, and when the time zone has no discount of a communication fee at the beginning but has a discount of a communication fee during the communication, the addition of the communication frequency is started.

[0018]

At step S3, when the communication is not started and the month is not changed (S8), the start of the next communication waits (S3). If the month is changed during the wait (S8), the communication frequency is reset (S9), and when the monthly maximum discount service is active (S2), the start of the communication waits (S2). When the monthly maximum discount service is not active (S2), the processing is finished.

[0019]

Effect of the invention

As explained above, according to the present invention, the monthly maximum discount service in a time zone with a discount of a communication fee can be effectively utilized. Therefore, since the reference frequency of the monthly maximum discount service is largely lowered and the object limit of the monthly maximum discount service is raised, the communication fee can be prevented from being charged.

Brief description of the figures

Figure 1 is a constitutional block diagram showing the telephone set with a communication frequency display function of an application example of the present invention.

Figure 2 shows the display content of a display part of the telephone set with a communication frequency display function of the present invention.

Figure 3 is a flow chart showing the operation of a frequency adder of the telephone set with a communication frequency display function of the present invention.

Explanation of symbols

- 1 Telephone set control part
- 2 Measurer
- 3 Frequency adder
- 4 Display part
- 5 Clock means
- 6 Central control device
- 7 Memory
- 10 Address data bus
- 31 Reset switch
- 41 Set switch

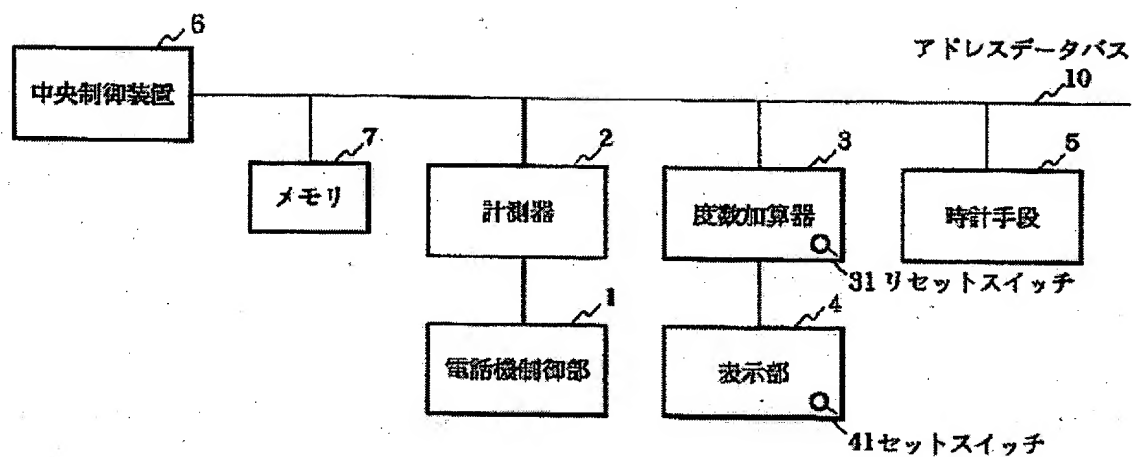


Figure 1

- Key:
- 1 Telephone set control part
 - 2 Measurer
 - 3 Frequency adder
 - 4 Display part
 - 5 Clock means
 - 6 Central control device
 - 7 Memory
 - 10 Address data bus
 - 31 Reset switch
 - 41 Set switch

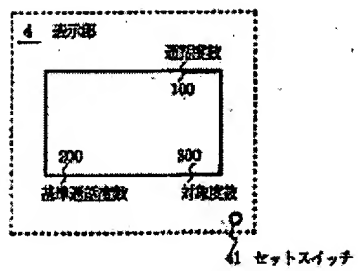


Figure 2

- Key: 4 Display part
- 41 Set switch
- 100 Communication frequency
- 200 Reference communication frequency
- 300 Object limit

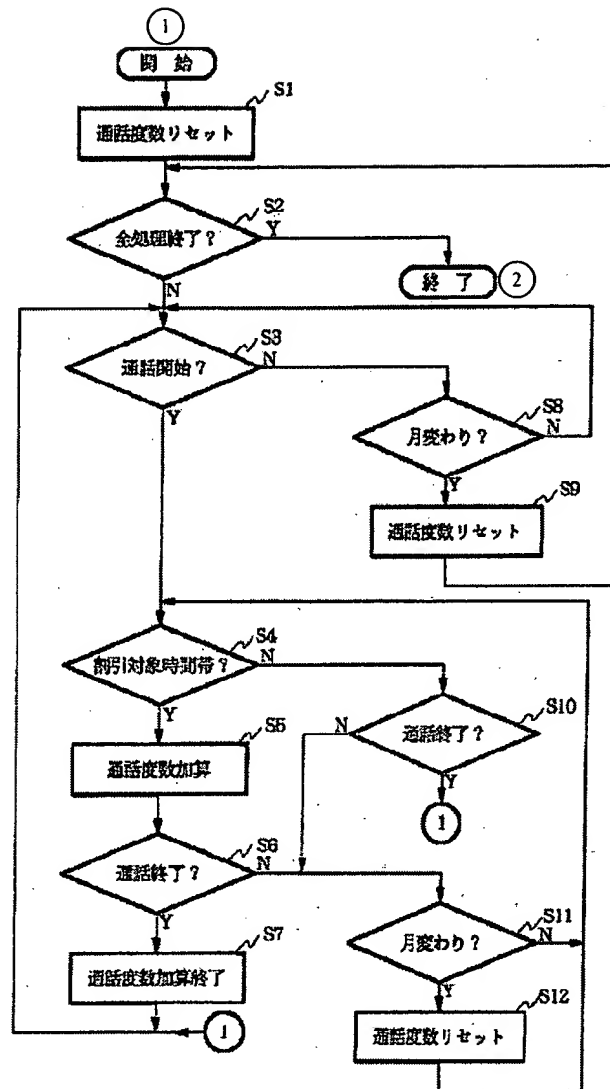


Figure 3

- Key: 1 Start
- 2 End
- S1 Reset of communication frequency
- S2 End of all processing?
- S3 Communication start?
- S4 Time zone for discount?

- S5 Communication frequency calculation
- S6 Communication end?
- S7 Communication frequency addition end
- S8 Month change?
- S9 Communication frequency reset
- S10 Communication end?
- S11 Month change?
- S12 Communication frequency reset